

Nuclear Division News



A Newspaper for Employees of the Nuclear Division, Union Carbide Corporation

Vol. 7, No. 4/February 19, 1976

Mock 'rainmaker' developed by ecologists

A new experimental device that makes "rain" to order is being used by Oak Ridge National Laboratory scientists to study the effects of sulfur and other atmospheric pollutants on vegetation and soils.

ORNL has more than 20 years' experience in the behavior and ecological consequences of radioactivity and trace elements released to the environment.

Designed by David Shriner, Environmental Sciences Division, the fully automatic "rainmaker" can be programmed to control the size of rain drops, the intensity with which they fall and their chemical composition. The system has been installed in a controlled-environment greenhouse, and may be operated unattended for up to one week.

Washout-rainout

The acidity of precipitation has recently received world-wide attention because of the increase in sulfur and nitrogen oxides released to the atmosphere as a result of energy production from coal-fired power plants, as well as other industrial emissions. Through processes of washout and rainout, these contaminants become incorporated in the hydrologic cycle.

Ordinarily, unpolluted rain is slightly acid, with a pH of about 5.7 (which compares to a neutral value of 7 on the scale used to measure varying degrees of acidity or alkalinity). Any lower pH value in precipitation is caused by some type of chemical in

the atmosphere, such as sulfur or nitrogen oxides.

Walker Branch Watershed

Data collected from the Walker Branch Watershed, a 250-acre experimental site located on the Oak Ridge reservation, indicate that levels of sulfur in rainfall account for 86 percent of the total sulfur input to the watershed. The acidity of individual rain storms monitored at Walker Branch has been as low as pH 3.25. The yearly average rain acidity measured at the watershed is pH 4.2.

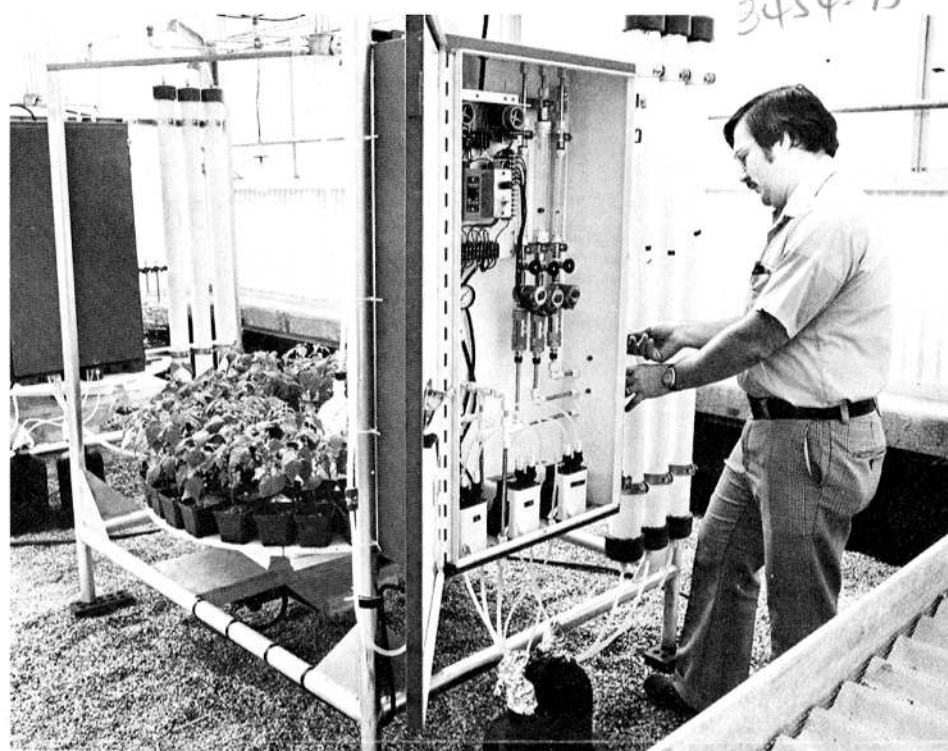
The rainmaking device permits the duplication of rain intensity and droplet size with variations typical of natural precipitation. It can be programmed to provide a shower or a storm of any desired duration.

Metering pumps supply controlled concentrations of chemical elements to purified water used to simulate acid rainfall. An identical system is operated as a control, and is programmed to produce unpolluted rainfall.

Effects on plants

Preliminary studies by Shriner indicate that simulated acid rain may significantly affect the physiological processes of plants. The weathering of protective surface waxes on both forest and agricultural plant species was found to be accelerated when they were exposed to acid rain. This could result in increased leaching of nutrients from the leaves of the plants.

In addition, it was found that simulated acid rain inhibited nodule



'THE RAINMAKER' — Dave Shriner, ORNL Environmental Sciences Division, draws a sample from one of three mixing channels from which simulated rainfall is dispersed. The bottles in the foreground contain chemical solutions which are fed through metering pumps to produce the desired acidity and chemical composition. Test vegetation is placed beneath the rainfall target area on a four-foot-diameter turntable which rotates at one rpm to assure uniform deposition. Kidney beans are currently being studied since their rapid growth pattern enables scientists to look at the effects of acid rain from seed through maturity in about nine weeks. The control apparatus to Shriner's left is completely automatic and may be programmed for unattended operation for up to a week.

formation on root systems of leguminous crops and caused the plants to be more or less susceptible to disease, depending upon the species of the plant, the type of pathogen, and the time the stress was applied.

ORNL scientists will continue using the rainmaker in studies to determine the consequences of prolonged exposure of natural ecosystems to acid rain. This and other information will be used to evaluate the possible effects of acid rain on vegetation and soils. These results will provide a basis for decisions on whether regulatory standards are adequate to protect the environment.

Other Staff

Linda Mann, a technician in the Environmental Sciences Division, has worked closely with Shriner in programming and monitoring operation of the rainmaking device.

Charles H. Abner, Plant and Equipment Division field engineer, provided engineering support in design and fabrication of the system. Fabrication was done by the Central Mechanical Shops at ORNL.

UCC's end-of-year sales, earnings told

Earnings for Union Carbide Corporation for 1975 were the second highest in the Corporation's history. Sales in the four quarter amounted to \$1.43 billion, an increase of two percent over the 1974 four-quarter final.

In releasing end-of-the-year statistics, Chairman of the Board F. Perry Wilson said there is clear evidence of recovery in the economy, both here and abroad. A continuing, although gradual, improvement in Union Carbide's performance as 1976 proceeds is expected.

Sales in 1975 reached a record \$5.67 billion, seven percent above the 1974 total. Net income was \$382 million, or \$6.23 a share.

inside ...



The last of the series of pre-Oak Ridge communities appears on pages 4 and 5 of this issue. Scarborough, along Clinch River, provided the area with many of its original settlers. The monument to the left is to New Bethel Baptist Church, one of the hubs of the community.

Other features in this issue:

- Y-12 ground breaking page 2
- Nuclear Division's 'oldest' veteran retires page 3
- Dr. Lincoln page 7
- Environmental Sciences reorganization page 7

next issue ...

The next issue will be dated March 4. The deadline is February 24.

calendar of events

TECHNICAL February 20

Biology Division Seminar: "Growth and Differentiation of Cell Clones Isolated from CNS Tumors," Wolfgang Wechsler, Max Planck Institute. Trailer Annex Conference Room, Building 9207, 12:15 p.m.

February 26 and 27

WATtec Conference and Exhibition;
Hyatt Regency Hotel, Knoxville, 8 a.m.

COMMUNITY

February 21

Civic Music Association presents: The Oak Ridge Chorus, Stephen

Young, Director. First United Methodist Church, 8:15 p.m. Admission: adults \$3.50; students \$1.75.

February 22

Children's Museum: Girl Scout Art Show, 2 p.m. and 4 p.m. Admission free.

Hadassah Art Show and Auction: Preview 2 p.m.; auction 3 p.m. Alexander Motor Inn. Admission free.

February 27

Oak Ridge Community Playhouse presents: "Sherlock Holmes and the Affair of the Amorous Regent." Playhouse 8:20 p.m. Admission: adults \$3; students \$1.50 (Fridays only). Other performances February 28, and March 5, 6, 12 and 13.

ORNL Credit Union tells new officials

John Dougherty was elected president of the ORNL Credit Union board of directors at the Credit Union's annual meeting. Dougherty, an incumbent board member, heads a slate of officers that includes Ben Smith, vice president; Lynda Lewis, secretary; and Roy Pruett, treasurer. Newly-elected board members are Mrs. Lewis and Robert Farnham.

Last year's credit committee, composed of Darrell Copeland, Joy Huffstetler and Brena Stevens, was re-elected.

Carroll W. Piper was the winner of the evening's largest cash door prize, a \$100 bill. Thirty-five additional prizes were awarded, beginning at \$10. A total of 776 persons registered for door prizes at the meeting.

division deaths

James Bradford Sr., Y-12 Area Five Maintenance, died February 4 in the Sweetwater Hospital. A native of Etowah, he first worked in the Oak Ridge Gaseous Diffusion Plant from 1953 until 1961, and came to Y-12 in 1963.



Mr. Bradford

He is survived by his wife, Margaret Smith Bradford, Philadelphia; a son, James Bradford Jr.; and a sister, Robbie Hall.

Funeral services were held February 6 at the North Point Cumberland Presbyterian Church with the Rev. Ralph Miller and the Rev. James H. Upton officiating. Burial was in the North Point Cemetery.

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nuclear division news



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BEFORE AND AFTER — An old file turned up the photograph at right, showing what the Y-12 Plant looked like on January 1, 1943, as the Corps of Engineers broke ground on the massive Manhattan Project. The aerial view above shows what the plant looks like today ... more than 32 years later. The plant served its original purpose — to produce enough fissionable materials for atomic bombs which were to end World War II — and today, with its highly sophisticated and complicated engineering and machining capabilities, still serves the nation's defense and other vital needs.



question box

If you have questions on company policy, write the Editor, Nuclear Division News (or telephone your question in, either to the Editor, or to your plant contact). Space limitations may require some editing, but pertinent subject matter will not be omitted. Your name will not be used, and you will be given a personal answer if you so desire.

Longest company service?

QUESTION: Which Nuclear Division employee at the Oak Ridge Installations has the most continuous Company service?

ANSWER: Adrian F. Stephenson, who started to work for Union Carbide on August 23, 1929, has the most service. He plans on retiring February 29, 1976. After he retires, the five employees with the longest service are:

Name	C.S.D.
Carl C. McDowell (Paducah)	7/25/33
William E. Poulsen (Y-12 Plant)	12/16/35
Roy L. Rollins (ORGD)	4/17/36
Tennyson I. Sloan (Y-12 Plant)	8/31/36
William H. Hall (ORGD)	9/1/36

Life insurance in retirement

QUESTION: I recently retired from ORGD with more than 15 years' Company service. Do I have any paid-up life insurance?

ANSWER: If you had been a member of the Group Insurance Plan for at least one year prior to retirement, the Company continues a

reduced amount of Basic Life Insurance coverage for you for the rest of your life and you do not have to pay any premium for it. The formula for the reduced insurance appears on page 9 of the Group Insurance Plan booklet. If you have misplaced your booklet, ask your Benefit Plans Insurance Office how much insurance you have.

Parking lot controversy

QUESTION: How can Company officials insist they have no jurisdiction over the parking lots at portals if cars are damaged or property stolen from them; and still issue reprimands and even terminate an employee for the way he parks? Surely there is something illegal about this.

ANSWER: There are different types of jurisdiction and responsibilities. The Company does not have responsibility for vehicular accidents or for personal property stolen from private vehicles in the parking lots. In Oak Ridge, this jurisdiction rests with the Oak Ridge City police; in Paducah with the State police and County Sheriffs' Department.

The control of access to, parking, and exiting from parking lots is a different matter. In order to better insure an orderly, safe arrival and departure for Company employees, visitors, fire, police and other security type vehicles, the Company has designated parking areas and traffic flows.

The Company does not initially discipline those individuals parking incorrectly. It does alert the individual that he/she is parking improperly. If an employee insists on ignoring the rules after repeated warnings, some further action is necessary. Fortunately, it is seldom necessary to go beyond the warning stage.

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46 years with UCC

Early retiree boasts most company service in division

The year 1929, by any measure, was a memorable one. It started early with the St. Valentine's Day massacre in Chicago. The Teapot Dome scandal was resolved in the courts, and October 29 exploded across the headlines with the beginning of national panic. PH 76-213

Adrian F. Stephenson has more reasons than the above to remember the last of the Roaring 20's. It was August 23 of that year he began work at Union Carbide in South Charleston, W.Va. Electing early retirement the end of this month, Stephenson takes with him the longest company service record on the payroll in the four Nuclear Division facilities.

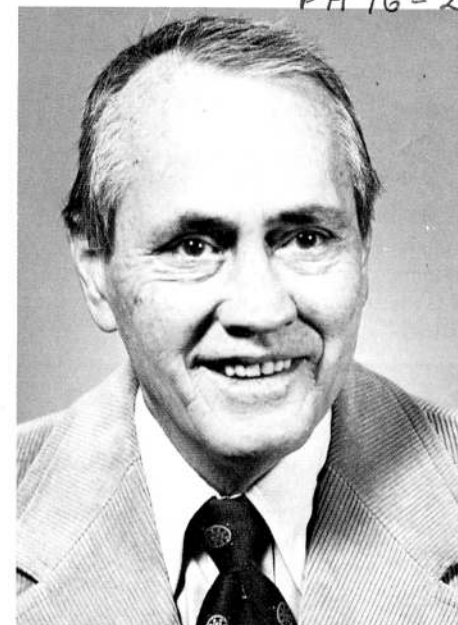
A native of South Charleston, Stephenson came right out of public schools there to work in the Vinylite Plastic Division, while the "magic plastic" was still in the research and development stage. He then transferred to a large production complex at the West Virginia plant.

It was a raw day in February that Stephenson first came to Oak Ridge. "You had to sign more papers then than you do now," he says. "We got a house on Porter Road (which they later purchased), and were told to go back to Charleston and turn our notice in."

"The Oak Ridge facility was under the Chemicals Division then, as was my plant, so a transfer was no problem. I actually came back on March 12."

He has worked as a cascade foreman, and as a relief foreman all over the Oak Ridge Gaseous Diffusion Plant. "The only place I haven't been working is K-31 and K-33," he said.

The Stephensons live at 113 Porter Road, and have five children — two girls and three boys. Two of the sons are employed in the Nuclear Division: Bill in Purchasing and Mike in Gaseous Diffusion Development. Mrs. Stephenson is the former Gladys Marie Vansickle.



Adrian F. Stephenson

"This was a funny, funny place," Stephenson related. "I knew a boy that got drafted into the Army, then was sent back here after he finished basic ... on Army pay! But, I still plan to remain in Oak Ridge. Two or three days away from this place and I'm ready to come back."

Stephenson does plan a trip to Garden City, N.Y. to bowl (bowling, golf and camping are his favorite past times.) "If you hear a noise like a jet breaking the sound barrier, it's me with a 300 game!"

Rheumatoid arthritis has curtailed some of the veteran's activities, but not his enthusiasm.

"For the people remaining at ORGD, and the others who have already retired, please accept my sincere thanks for your friendship throughout the years," the retiree said.

Promoted to reactor supervisor



Charles H. Helton has been promoted to reactor supervisor in Oak Ridge National Laboratory's Operations Division.

Helton joined Union Carbide in 1953 in the Oak Ridge Gaseous Diffusion Plant's Maintenance Division. He later transferred to the Y-12 Plant, where he worked as a production machinist. In 1965 Helton came to ORNL as a member of the High Flux Isotope Reactor's startup crew and has worked at that facility ever since. He was a reactor controller prior to his promotion.

A native of Adairsville, Ga., Helton was raised in Maryville. He and his wife, Phyllis, live at 59 Dogwood Drive, Norris. They have a daughter and two sons.



1975-76 WORLD PRESS FELLOWS — Journalists from all over the world visited facilities in Oak Ridge recently for an overview of operations here. In the front row are, from left, Linda Fisher, Macalester College; Margrit Gerste, West Germany; Razia Bondrey, Pakistan; Jane Wilson, Macalester College and Karin-Lis Svarre, Denmark. In the back row, from left, are Julio Terre, Argentina; Javier Beytia, Chile; Emmanuel D'Silva, India; Terrace L. Randolph, Program Director from Macalester College; Djamal Zidi, Algeria; Albert Mvula, Zambia; Hiroki Chiba, Japan; Enoch Duma, South Africa; and Franciszek Nietz, Poland. Each year, World Press Institute selects 12 outstanding journalists to spend eight months studying first-hand America's history, present realities and future aspirations.

Scarboro Community

'The land was sweet and good; and I did what I could'

by James A. Young

"When I first came to this land —
I was not a wealthy man,
Then I got myself a farm
Called my farm — muscle in my arm;
But the land was sweet and good
And I did what I could."

And so the old ditty goes — "got myself a shack, called my shack — break my back;" "got myself a cow — no milk now;" "got myself a hen — no eggs again;" "got myself a wife — run for your life;" ... "but the land was sweet and good; and I did what I could."

He crossed the mountains in the mid-1840's to settle in the lush bottom-lands along the Clinch River, formerly called the Pellissippi by the Cherokees. The son of an Irish immigrant, fleeing the potato famine of 1820, he had taken part in the Indian expulsion of 1838 and was tired of military service. He sold his North Carolina holdings, given in part as a land grant for military service, and pushed westward with the other Irish, Scotch, English and German immigrants. The Clinch River looked good to Martin McCoy — and the

Welsh maiden down the river looked even better. Shortly after settling on his land in one of the hidden coves of the river (where the Clark Center Recreation Park is now located), he married Viame Peak and began to live out his long life as a Tennessee farmer.

Thus the story of Scarborough, the last of the series of pre-Oak Ridge communities, is told ... only multiplied manifold to relate the filling up of the sandy shores of the winding Clinch. Scarborough was named for three brothers — Jonathan, David and James — who came down from Virginia in the early 1800's. They were later joined by familiar names in the valley ... Peters, Keith and England. Later came Freels, Ford, Bailey, Lee, Ellis, Cross, Burgess, Johnson, Moore, Wilshire, Gorman, Taylor, McFarland, Robinson, Diggs, Brummitt, Kerr and Lockett families, and others.

Old home restored

Scarboro, as it is now spelled, extended from the John Jones farm across the river from Edgemoor down the Clinch to Meltons' place near White Wing Bridge (the Meltons gave us the name Melton Hill Lake). Bethel Valley Road took up from Raccoon Valley Road and inched its way along the winding river. Scarboro, more than any of the other three areas of pre-Oak Ridge, resembles its old self. With the exception of the Oak Ridge National Laboratory complex, across the road from New Bethel Church, the valley looks as it may have 100 years ago. Some of the old homes still stand, as the Comparative Animal Research Laboratory of The University of Tennessee houses some of its employees in pre-Oak Ridge homes near the Oak Ridge Memorial Gardens. (The UT lab has actually reconstructed the old "Freels home"

inside the restricted area, and uses it for picnics and other outings.)

At the crossroads of Kerr Hollow Road and Bethel Valley stood traditionally the news source of early America, a small country store. Actually, there were three country stores in the valley, run by Hobart Brimer (or "Hob" as everyone called him), Jim Freels (who was one of the last persons to evacuate the land in late 1942, taking with him his gas pump and everything else he could pull up) and Edgar Ford.

Among the early settlers was one Captain John Harrell, who accompanied Washington in his famous crossing of the Delaware. His descendants are scattered throughout East Tennessee and the name Harrell is well-known in the area.

Trade-outs at store

"We came to Scarboro in the mid-20's," writes one reader who now lives in Kentucky. "We picked berries for 10 cents a gallon and traded them at Brimer's for a yard of material, which also cost a dime. If there was nothing that met our fancy, Hob would give us a "due bill" which we could barter later when something did come along that we liked.

"Sunday school was at the Presbyterian Church, revivals at the Methodist Church and baptizings at New Hope and New Bethel Baptist Churches (actually using the cold waters of Bear Creek or East Fork for baptisteries). We loved to pick wild strawberries in the Spring and look for new nests among the vines and trees. The mountain air was pure and sweet."

Scarboro School burned

The four churches in the area were the Cumberland Presbyterian, New Bethel Baptist, New Hope Baptist and Mt. Vernon Methodist. New Hope was located at East Portal near the Y-12 Plant, New Bethel still stands across Bethel Valley from ORNL, and Mt. Vernon was located in the woods near Building 9213, across Pine Ridge

(Please see page 5)



OLD FREELS HOME — UT's Comparative Animal Research Laboratory owns one of the original cabins in this area, the old Freels home. The "double" cabin is separated by a stone chimney and has been reconstructed for picnics and lunches within CARL's area. (The site is restricted to the public.) Officials believe the home sits on its original site, near Freels Bend in the Clinch River.



STILL STANDING — The William Freels home still stands on Bethel Valley Road, occupied by Merrill Bird, a UT employee at CARL. The row of houses now occupied by CARL employees were not aligned in a row, as they are today, but some of them were moved to their present location.



KERR HOME — Lula Kerr Fox mans an axe with her niece, Bonnie, outside the old Kerr home which stood between the Winchester place and Bethel Valley Road. The Kerrs were descended from the Winchesters, and their home was typical of the Scarboro community.

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Scarboro Community

(Continued from page 4)

from Y-12. New Hope and Mt. Vernon are now marked only by ancient cemeteries.

"The ice truck came through about twice a month and we would buy a block of 100 pounds to store in the basement. Then many Sundays we would make homemade ice cream and gather our friends in to eat it."

Scarboro Elementary School burned in the late 20's and was rebuilt with brick. (Part of the structure is still standing and is used by CARL as part of its administrative offices.) Another old cemetery dots the landscape behind CARL's office... known as the Scarboro cemetery where rest many of the founders of the community.

There was a raft at Solway and a ferry operated by the Lees up the river. The raft was powered by long poles and used only when the Clinch was low.

River flooded land

Before the 1930's when Norris Dam was built, the Clinch overflowed every four or five years, giving farmers a new supply of rich top soil, fertilizing their land anew. In one of these floodings a giant Indian burial site was unearthed to be later studied by local anthropologists and archaeologists. Almost 200 remains were removed from the Bull Run Steam Plant site at Edgemoor, before the plant was built.

"There was plenty to keep us busy," writes our Kentucky resident, "we had hog-killings, quilting parties, corn-shuckings, all-day singings at the church, and so on. When a baby was born — two of my brothers were born in Scarboro — everybody came and pitched in to help with the chores. The only doctors were in Oliver Springs and Byington, across the river, so many of the babies were 'hand-delivered' by nannies and midwives.

"Those were happy times."

Freels home occupied

Bill Freels, employee in Y-12's Laboratory Operations and

descended from the pioneer family, provided some of the photographs for this series and writes of his father: "He carried the mail — by buggy, by mule, by walking and later by auto — from Scarboro through the Robertsville community back across the mountain by the Oak Ridge Country Club, up Bear Creek Valley, then over the ridge to Bethel Valley by almost the same road we now use to go to ORNL, by Building 9213. From there he returned to the office... our home which still stands along Bethel Valley Road. Merrill Bird, of UT's CARL, now lives in that Freels home."

Freels Bend is the giant, horse-shoe-shaped flat-land that juts into the river just above the Carbide Park.

The residents of Scarboro were as unhappy as the settlers in Wheat, Robertsville and Elza upon leaving their farms and lands. But, as one of them said, "What do you do? The government needed your land to win the war. Who would have refused such a request as that?"

Martin and Viame Peak McCoy are buried at New Bethel, along with several of their daughters and their families. A memorial stands behind the church which reads "Erected in Memory of New Bethel Baptist Church, Opened 1851 Closed 1942... Church Building Stood 47 Feet in Front of this Stone."

Church still stands

Little did the church fathers know then that the Corps of Engineers, the Clinton Engineer Works, the Atomic Energy Commission and later the Energy Research and Development Administration would have use for the small white church.

It still stands in Bethel Valley... once a haven for worshippers who shared their faith and used the place for social gatherings in those lean years when the church was their only means of contact with each other.

It stands also as a memorial to a band of settlers, happy in their own valley, who had to move and leave their beloved land.

This series of stories is dedicated to those hundreds who were scattered to other sections in the forced removal of 1942.



NEW BETHEL — One of the few churches in the pre-Oak Ridge site is New Bethel Baptist Church, founded in 1851. Leaders in the church voted to take the treasury and erect a monument to the church as their last official action. Early valley residents are buried in the cemetery behind the church. The church was a center of community activities in the valley a hundred years ago, the scene of homecomings, all-day singings and decoration days. Many memories are invoked by the little church in the valley. "It still stands there," one resident said, "as a reminder of our good past. Glad they left it for present residents of Oak Ridge to view."

Regional blood coverage extended into Paducah area; needs still grow

Last month was officially decreed National Volunteer Blood Donor month by President Gerald R. Ford. He hailed it "an opportunity to honor those fellow citizens who willingly offer their blood to benefit those who need it."

"In this first month of our Bicentennial year, it is most appropriate that we dedicate ourselves to the achievement of an all-volunteer supply of blood to meet the nation's needs," the President's proclamation stated. "I welcome this occasion to urge all Americans to make this worthy goal a reality in 1976."

The need for an all-volunteer blood supply was immediately hailed by the American Red Cross, which supplies more than half of the nation's blood, free of charge, thanks

to the volunteers who choose to share this life-saving gift of theirs to others. (In the Red Cross plan, there is no membership fee required, no replacement asked, and no profit whatsoever. Their philosophy is that those who need blood should have it.)

The Red Cross periodically visits the area for the collection of blood, to be supplied to area hospitals on call, from the Nashville Regional Blood Bank. The Paducah area, including several surrounding counties, was recently added to the Nashville region. The Bloodmobile will visit the Paducah area this year for collections.

A blood donor in this area is not only covered himself, his family is also covered for blood needs, wherever they occur.

The Bloodmobile will visit Oak Ridge next month for another two-day call. They headquarter on Wednesday, from 3 p.m. until 9 p.m. ... then return the following day, Thursday, from noon until 6 p.m. (Details of the March visit will be forthcoming.)

Plan now to drop by the mobile unit on your way from work next month. You'll be surprised how painless the process is... and it takes less than an hour, an hour which very well may make the difference between life and death for another human being.

Open-heart surgery requires, at a minimum, 10 pints of blood, often more. And open-heart surgery increased annually. Goals for each Red Cross chapter must be increased to meet the rising needs for blood in our hospitals.

You can help by sharing your blood with someone you don't even know. "Giving anonymously, without reward, is perhaps the most noble gift of all," someone once said. Try donating some blood next month, and feel the inner-glow you get from helping someone you will never see, someone who will never be able to say, "Thanks so much, brother. You saved my life."



CROSS ROADS STORE — Jim Freels, uncle of Bill Freels, Y-12, owned and operated this store in the Scarboro community. Other stores were owned by Hobart Brimer and Edgar Ford. Storekeepers in the valley often trade eggs, berries or almost anything for merchandise. If a surplus of eggs amassed, they graded or "candled" them and transported them to Knoxville. (A sad note is added to the Freels' episode... Mr. Jim Freels died at the age of 90 last week.)

recreationotes

VOLLEYBALL LEAGUES

The Diggers are still the team to beat in the three Volleyball Leagues. Only one loss has been posted to their account, as the Skinks stand high in the Carbon League, and the Rad-Fizz gang rein over the Nuclear League.

League standing follow:

ATOMIC LEAGUE		
TEAM	WON	LOST
Diggers	38	1
Taxi Squad	37	2
Quarks	24	15
Ecomen	24	18
Sportsmanship	14	22
Old Men	13	23
Shooting Stars	6	33

CARBON LEAGUE		
TEAM	WON	LOST
The Skinks	45	6
The Ball Busters	44	10
Hawks	35	16
The Group	34	19
Gauss House Gang	30	21
Sud Soakers	30	27
Odds & Ends	28	26
"Are You Sure"	22	29
Rinkey Dinks	10	44

NUCLEAR LEAGUE		
TEAM	WON	LOST
Rad-Fizz	35	10
Over-The-Hill Gang	33	12
Artie's Army	24	12
Pogo's	23	13
Lucky Spikes	21	21
Computes	18	21
Maxwell Demons	18	21
Sloths	14	25

ANOTHER HOLE-IN-ONE!

Charley Baxter, Y-12 Machine Shop, recently aced hole number 2, a 165-yarder at South Hill Golf Course. He used a five-iron for the magic shot, and was playing with fellow Y-12ers Bill Sise, Danny Boyd and A. C. Wright. In addition to attesting the feat, the trio said the only reason Charley got the ace was to get even with his wife, who had accomplished the impossible some time ago!

ORNL BOWLING

The Gutterfinks keep a safe margin in the A League, winning more than 70 percent of their rollings. Jim Carleton, ORAU, rolled a 706 handicap series in late January; and Rob Robson, Ten Pins, rolled a single of 243.

The C League sees the Damagers by five points out in front of the Pin Heads. Sam Samuels did it again ... games of 209, 231 and 183 for a series of 622, all scratch, of course.

The ORNL Ladies League belongs to the Mousechasers in early league play. Brena Stevens dominated the boards recently with scratch scores of 226 in a single, and 549 series. Elizabeth Phipps put a 642 handicap series up for highs.

The Odd Balls hold a two-point edge in the Family Mixed League for Carbiders. John Patton and Edith Duckworth shared recent honors, with scratch series of 533, 487 respectively.

SKEET LEAGUE

January winners in the Carbide Skeet League included Alan VanHull, Y-12, who fired a score of 49.156. Phil Hayes, ORNL, places second with 48.152; and George Kwiecien, also of ORNL, came in third with a 48.115.

A beginner's skeet shooting class will be held at the Oak Ridge Sportsmen's Association's range this spring. It is open to all comers, and membership in ORSA is not required. Details may be obtained from Vernon Raaen, extension 3-6973; Jim Rhew, 3-5033; Bill Davy, 3-3808; or George Kwiecien, 3-6875.

BOWLING SCORERS NEEDED

Can you keep bowling scores? Officials at the All Carbide Bowling Tournament at Ark Lanes both this week-end and next need scorekeepers and score checkers.

Just check the schedule and if you can be of assistance come on down. Your fellow bowlers will appreciate it.

Circus discount deadline



If you plan on going to the circus with the discount tickets (application shown in the last issue of *Nuclear Division News*) you'd better get with it. There is a deadline of March 6 on these discount tickets. Applications must be post-marked by midnight March 6 to be accepted.

Nuclear Division employees may get \$1.50 off for each \$5 and \$6 ticket purchased. If you missed the application we have a few in the office. Call us at extension 3-7100.

ORGDP BOWLING

The All Stars still hang onto the lead in the Tuesday League, as action goes into the last section of the second half. M. S. Ginsburg took high game recently, and Furman Strang rolled high series. Both bowlers roll on the Atoms team.

The Wednesday League sees the Hi-Rollers into an early lead as the second half gets underway. Gene Epps, Losers, rolled a 234 game in February; and Troy Beets, Sues Sooners, put a 637 series up on the boards.

Elaine Griffies dominated the ORGDP Women's League, rolling a single of 208 and a series of 511. Janice Lovelace put handicap games of 200, 189, 216 together for a series of 605. The Uptowners hold a commanding lead in the action.

Y-12 BOWLING

The Mini Strikes hold the helm down in the C League, three points ahead of the Sunflowers. Del Lay put a 245 scratch game up recently, and Charles Baxter's 262 handicap single holds high.

The Playboys take the lead in the Classic League, one in front of the All Stars and Rippers. Jim Lawhorn's 726 handicap singles is still high, and his 256 scratch game is still good.

The Friskies took a four-point win from the Alley Cats to assume first place in the Y-12 Mixed League, as the Rollers split two with their opponents. Dick Huber rolled high during early February bowling to pace his team.

BASKETBALL LEAGUES

A total of 22 big basketball teams line up for winter play in two leagues — as the Atomic and Nuclear League square off for action. The Labor Gang in the Nuclear League has not lost one so far.

League standings follow:

ATOMIC LEAGUE		
TEAM	WON	LOST
GBU's	3	2
Testers	4	0
Destroyers	3	0
The J.T.'s	2	1
Allstar Bombers	2	1
The Roaches	2	2
Sweathogs	2	2
Fabulous Five	1	1
The EM's	1	2
D-Shift Blues	0	3
Die Hards	0	3
The Long Shots	0	2
Beelers Bombers	0	2

NUCLEAR LEAGUE		
TEAM	WON	LOST
Labor Gang	5	0
Gunners	3	1
Mets	2	2
Basket Weavers	1	1
Recycles	1	1
The Hookers	1	2
Popp's Mops	1	2
The Nicks	1	3
ORMAKS	0	3

HIGH POWER RIFLEERS

The All Carbide High Power Rifle League will hold its first match in late March of 1976. The matches are scheduled for Saturday mornings as follows: March 27, April 10, April 24, May 8, May 22, and June 12. Any Carbide employee may participate. Further details are available from the Recreation Department, extension 3-5833.



wanted

Y-12 PLANT

WILL JOIN CAR POOL from Crossroads West apartments, Paper Mill Road exit, to Biology Portal, straight day. Diane Abernathy, plant phone 3-5045, home phone Knoxville 584-0917.

WILL JOIN CAR POOL from 504 Woodland Drive, Clinton, to North or Central Portal, straight day. C. W. Anderson, plant phone 3-7392, home phone Clinton 457-2687.

JOIN CAR POOL from Friendsville area, 8-4:30 shift. Robert Meacham, plant phone 3-5048, home phone 983-4993.

RIDERS from West Inskip, Central Avenue Pike, Norwood, Cherrybrook sub-division and Cherokee Ridge sections, Knoxville, to East,

North or Central Portals, straight day. J. F. Baker, plant phone 3-5935, home phone Knoxville 947-3396.

ORGDP

RIDERS from West Knoxville area to any portal, ORGDP. Straight day, beginning either at 7:45 a.m. or 8. C. J. Hinton, plant phone 3-9661, home phone Knoxville 693-7502.

ORNL

Two or three CAR POOL MEMBERS to join pool now in its seventeenth year. From Hillside-Pennsylvania-West Outer area, Oak Ridge, to any portal, 8:15-4:45 shift. Contact Tom Burnett, plant phone 3-6939, home phone 483-1975, or Dick Strehlow, plant phone 3-1175, home phone 482-3240.

RIDERS from Halls/Fountain City area to either portal, 8 or 8:15 shift. A. J. Farmer, plant phone 3-6479, home phone 922-2556.

RIDERS from Papermill Road - Bearden area, 8 or 8:15 shift. Ray Pearson, plant phone 3-1875.



SOON — SOON — SOON — If you're like every other red-blooded American, you are standing around waiting for the first bloom of Spring. The University of Tennessee's Arboretum, on Kerr Hollow Road in Oak Ridge, will soon be bursting with dogwood and red bud. If you haven't seen it in its glory, you haven't seen anything. It's pretty any time of the year, but takes on an extra something during late March and early April.

475-157



The CAT scanner

by T. A. Lincoln, M.D.

(Editor's Note: Dr. Lincoln alternates his regular column with "The Medicine Chest," where he answers questions from employees concerning health in general. Questions are handled in strict confidence, as they are handled in our Question Box. Just address your question to "Medicine Chest," NUCLEAR DIVISION NEWS, Building 9704-2, Stop 20, Y-12, or call the news editor in your plant, and give him or her your question on the telephone.)

In 1973 a new diagnostic device called the CAT scanner went into service at the Mayo Clinic. In only three years this instrument has already had a profound effect on American medicine, and it is likely that by 1980-85 it will have completely changed the practice of diagnostic radiology. Many observers call it the most important advance since the discovery of X rays by William Roentgen in 1895.

CAT stands for computerized axial tomography. In order to explain how the device works, it is necessary to start with simple X ray pictures. In these, the image or picture seen on the film is due to the differences in the ability of the X rays to penetrate various tissues. When taking an X ray of the wrist, the bones stand out beautifully because the bone is dense and the surrounding soft tissues are meager in quantity and low in density.

Shadows present problem

A chest X ray is also reasonably successful, because the air in the lungs does not absorb X ray energy and provides a sharp contrast with a solid mass or an area of fluid in the lung. A small change from normal can still be missed because it gets lost in the multiplicity of superimposed shadows caused by chest muscles, ribs, blood vessels and normal lung tissue.

To overcome this problem, especially in the gastrointestinal tract, radiopaque substances or air can be injected or swallowed to better outline organs. Radioisotopes can be used which concentrate in diseased tissue, allowing the area of pathology to be found. These techniques form the backbone of present day diagnostic radiology and nuclear medicine. Unfortunately, they are not as sensitive as desired, and the radiation exposure associated with them can be of concern if many studies have to be made.

One way to overcome the problem of superimposed shadows is with the technique called tomography. It is especially useful in better defining lung lesions. By having the X ray tube move in one direction and the film in the opposite, all chest tissue in front of and behind the area where the beam does not move is blurred.

If you will hold the middle of a pencil between your thumb and index finger and then move your fingers so the pencil moves back and forth, you can see that the pencil does not move significantly at that point where it is held by your fingers. If the eraser end of your pencil is the X ray

tube and the lead end your film, you can see how the point of no motion — the focal point — can be moved up or down.

Picture made via computer

In tomography, successive views (called cuts) can be made with the area of sharp focus moving in one centimeter cuts from front to back. If the lesion is a two-centimeter round mass ten centimeters deep within the chest, those cuts at that level should show it sharply, with all else a blur.

In a CAT scanner, the patient is fastened in a frame which can be rotated 180 degrees. At intervals of one degree, a tightly-focused beam of X rays is transmitted through the body and detected on the other side by a sensitive sodium iodide crystal which scintillates when struck by the beam. These scintillations, or sparkles of visible light, are picked up by a photo multiplier tube and the signals fed to a small high-speed computer. In a study of the head, the X ray beam is sampled at 160 equally-spaced positions for each degree of rotation so 28,800 (160 x 180) bits of electronic information are processed by the computer and a full three-dimensional image of the contents of the skull can be reconstructed.

The CAT scanner was developed by a man who doesn't even have a university degree. While working on pattern recognition by computers for Electrical and Musical Industries, Ltd., (EMI) in England, he got his idea. The result is the EMI scanner which was first tested in London and at the Mayo Clinic in Minnesota. It was fantastically successful, and already 500 have been sold. The original EMI scanner was designed for studies of the brain where other diagnostic techniques are especially unsatisfactory. Now, whole body scanners are being rapidly developed with numerous new ideas being tried.

Sensitivity an advantage

The principal advantage of CAT scanning is its remarkable sensitivity. The computer reconstructions can easily distinguish between normal and clotted blood. Normal tissue and diseased tissue, if localized and of only slightly different density, can be found. It may be possible to detect tumors only a couple of millimeters in diameter. The total X ray exposure to the patient is equivalent to or less than with conventional radiography, and it will probably be reduced as the technology develops.

One problem has been the need for the patient to remain absolutely motionless while the scan is made.

Environmental Sciences announces new appointments, reorganization

2997-74

The appointment of David E. Reichle and Edward G. Struxness as associate directors of the Environmental Sciences Division at Oak Ridge National Laboratory has been announced by Stanley I. Auerbach, Division Director.

Struxness' responsibilities include impact assessment and earth science related activities of the Division. Reichle is responsible for aquatic and terrestrial research, including new programs related to coal conversion and effects of energy technology on the environment.

Struxness

Struxness joined the Nuclear Division at the Y-12 Plant in 1943. He transferred to ORNL in 1953 and served as assistant director of the Health Physics Division and director of the Laboratory's Environmental Impacts Projects. Struxness was appointed assistant director of Environmental Sciences in 1973, and has served as manager of the Environmental Assessments programs.

A native of Minnesota, Struxness holds a degree in biology and chemistry from Luther College, and has been certified by the American Board of Health Physics. He has done graduate study at both The University of Tennessee and Northwestern University.

Struxness was the recipient of the American Nuclear Society's Special Award for Waste Disposal and Management in 1975. He is a member of Committee 4 of the International Commission on Radiological Protection, and the Health Physics Society.

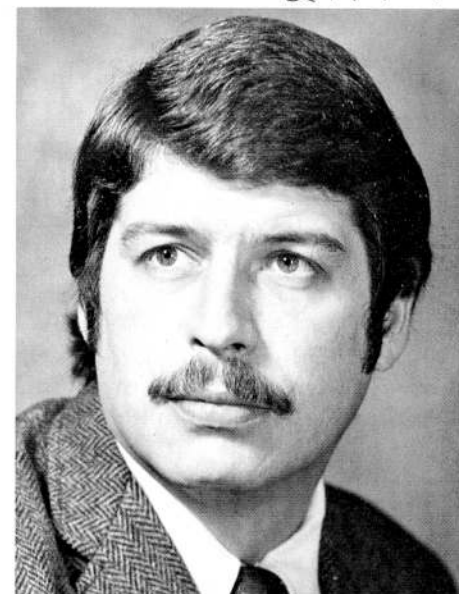
Reichle

Reichle received his B.S. degree from Muskingum College and M.S. and Ph.D. degrees in ecology from Northwestern University. He came to ORNL on a two-year AEC post-doctoral fellowship in 1964, and joined the Environmental Sciences

The EMI scan takes five minutes, which is not difficult since the head can be held still in a holder. Scans of the lungs and heart will not be possible until the time is shortened enough that the patient can hold his breath. A twenty-second scanning device is already available and a five-second whole body scanner is being developed in Boston.

These scanners are expensive. They range from about \$250,000 to \$700,000. However, they can be used continuously by scheduling patients around the clock. The cost of a single scan is \$200 to \$500. When one considers all that can be accomplished with a single scan and that the patient need not be admitted to the hospital, these costs are not as bad as they seem.

When whole body scanners become available in large hospitals, more and more early pathology will be found. Cures will be more common, but probably a lot of frantic searching, even exploratory surgery which later proves to be unnecessary, will occur. A revolution in diagnostic medicine is underway. Where it will lead, no one can predict at this time.



David E. Reichle

1737-75



Edward G. Struxness

Division staff two years later. He had served as program director for Ecosystem Analysis since 1970.

Reichle has served on a number of professional advisory committees for the Atomic Energy Commission (now ERDA), the National Science Foundation, the National Academy of Sciences and The Institute of Ecology. He is currently serving a three-year term on the Environmental Studies Board of the National Academy of Sciences.

A Fellow of the American Association for the Advancement of Science, Reichle holds membership in several professional societies.

Reorganization

Auerbach also announced the reorganization of the Division into five new sections.

Stephen V. Kaye will head the Analysis and Assessments section, with responsibility for development and application of methodologies related to the analysis and assessment of the impact of energy facilities on human populations.

James O. Duguid will serve as section head for Earth Sciences. This section will be responsible for soils, geochemistry, atmospheric and hydrologic sciences, and both basic and applied waste research related to energy technology.

The Aquatic Ecology section will have responsible for basic and applied aquatic research in fresh-

(Please turn to page 8)

Apprenticeship Program graduates honored



Forty graduates of Oak Ridge National Laboratory's apprentice program were honored recently at a luncheon arranged by the ORNL General Apprenticeship Committee. The graduates, members of the Plant and Equipment and Instrumentation and Controls Divisions, heard congratulatory talks by Harry E. Seagren and C. J. Borkowski, directors of the respective Divisions, and by Robert G. Keil, vice president of the Atomic Trades and Labor Council, and Mansell E. Ramsey, ORNL Assistant Director for Services.

Originated in 1948, the Laboratory's Apprenticeship Program includes most of the crafts represented at ORNL. The four-year program begins with a year of orientation work during which the apprentice serves as a "craft

helper," followed by three years of combined classwork and on-the-job training. After successfully completing the program, participants receive a certificate from the Department of Labor granting them journeyman status.

The Apprenticeship Program is administered by the General Apprenticeship Committee, assisted by Craft Apprenticeship Committees. The Apprentice Training Staff, headed by Truman H. Freeman of the Personnel Development Department, Employee Relations Division, coordinates the program. Present members of the General Apprenticeship Committee are Bert G. Catron, Robert M. Farnham, Thomas H. Gilliam, Carl S. Johnson, Frank W. Manning and James A. Slice.

anniversaries

Y-12 PLANT

30 YEARS

Gibson Morris, Engineering Division; Campbell R. King, Employment Department; Charles E. Newlon, Radiation Safety; James S. Cole, Production Engineering and Scheduling; Joel C. Thompson; Laboratory Operations; and Forrest B. Waldrop, Development Division.

25 YEARS

John McGhee Jr., J. R. Barkman, Brice M. Burrus, Mamie R. Cox, John R. Gresham, Thomas K. Bishop Jr., Fred Vaughn, William S. Porter, Kenneth L. Prewitt, Keith Patrick, Robert N. Armstrong, Fred A. Tallen Jr., Donald L. Anfinson, William L. Fairbanks, Carl G. Brewster, William T. Arrowood, John F. George Jr., William J. Williams, Max Whitley, Toney V. Gable, Willie L. Parton and Alice J. Mattingly.

20 YEARS

Robert W. Johnson, Boyd M. Adkins and Gaines Aldridge.

ORGDP

30 YEARS

William L. Calvert, Technical Evaluation Department; Perry B. Smith, Machine Shop Department; Vaughn L. Thomas, Engineering Division; Noah E. Howard, Janitors Department; James A. Walls, Shop Services Department; and Eli Y. Kimmerly, Dimensional Inspection.

25 YEARS

Harld S. Rutherford, Carl H. Dorr, Mary G. Culbertson and Daryl M. Papke.

PADUCAH

20 YEARS

Elvis Crafton.

GENERAL STAFF

25 YEARS

Henry B. McBride Jr., Mary Ellen Hazlett and Fred C. Hutton.

20 YEARS

James A. Corn and Margaret K. Kirby.

ORNL

30 YEARS

Raymond W. Tucker and George S. Sadowski, Instrumentation and Controls Division; Persa R. Bell, Biology Division; S. C. "I. O." Lindsay, Plant

and Equipment Division; Darrell E. Arthur, Health Physics Division; Howard R. Cannon, Plant and Equipment Division; Harry L. Watts, Engineering; Thomas G. Harmon, Analytical Chemistry Division, and James H. Cummings Jr., Finance and Materials Division.

25 YEARS

Ernest E. Parks, Sheldon Datz, Ward L. Wright, Merl M. Houser and Roslyn W. Bridges.

20 YEARS

Carol A. Proaps, David L. Laughlin, William E. Cunningham, William M. Johnson, and William J. Boegly Jr.

Environmental Sciences tells reorganization

(Continued from page 7)

water and marine environments related to energy problems.

W. Frank Harris heads the Terrestrial Ecology section, which will be responsible for basic and applied terrestrial research related to energy problems.

The Resources and Operations section will be headed by Robert L. Burgess. Division-wide research in modeling and systems analysis, computer operations, and data management and information resources will be the responsibility of this section.

Seven projects

A major portion of the Division's program is grouped into seven projects. These projects and their leaders are:

- Eastern Deciduous Forest Biome - Robert L. Burgess
- Environmental Impact Statements - Robert W. Brocksen
- Power Plant Effects - Charles C. Coutant
- Regional Resources Analysis and Planning - Dennis C. Parzyek
- Trace Contaminants Behavior - Robert I. Van Hook
- Transuranics - Roger C. Dahlman
- Coal Conversion Effluents - Carl W. Gehrs

Ada Misek Clinton's 'Woman of Year'

Ada F. Misek, a budget analyst in Finance and Materials Division, Oak Ridge National Laboratory, has been named "Outstanding Woman of the Year" by the Clinton Jaycettes. The award, based on leadership and community service, was made at the Clinton Jaycee/Jaycette annual meeting January 23.

Mrs. Misek, who was nominated for the award by the Clinton Business and Professional Women's Club, is involved in numerous area civic activities. As chairman of the Anderson County American Revolution Bicentennial Committee, she is coordinator of the county's Bicentennial activities, and was instrumental in obtaining for it the Bicentennial Community Status. She is co-founder of the Anderson County Historical Society, for which she is currently serving as vice president, and has also been active in a number of volunteer community services.

Mrs. Misek came to ORNL in 1954 and worked for 19 years as secretary to the assistant superintendent of the Plant and Equipment Division. In her



current position she is coordinator of the ORNL Commitment Information System. She lives at 606 Riverbend Road, Clinton, with her husband, L. J., an electrician in Plant and Equipment. They have two married children.



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